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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/841,284	04/24/2001	Harold J. Vinegar	5659-06000/EBM	4716

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EXAMINER

SUCHFIELD, GEORGE A

ART UNIT	PAPER NUMBER
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3672

DATE MAILED: 05/12/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/841,284

Applicant(s)

VINEGAR ET AL.

Examiner

George Suchfield

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 February 2004.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) See Continuation Sheet is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) See Continuation Sheet is/are allowed.
- 6) ☒ Claim(s) See Continuation Sheet is/are rejected.
- 7) ☒ Claim(s) See Continuation Sheet is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 2/24/2004.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Continuation of Disposition of Claims: Claims pending in the application are 2193-2199,2201-2218,2220-2238,2241-2269,5081-5087,5089,5090,5150-5153,5155-5192 and 5194-5227.

Continuation of Disposition of Claims: Claims allowed are 2232-2238,2241-2269,5081-5087,5089,5090,5150-5153,5155-5174,5200,5205-5217 and 5224-5226.

Continuation of Disposition of Claims: Claims rejected are 2193,2195,2196,2202-2215,2217,2218,2226,2228-2231,5175,5177,5180-5190,5192,5194,5197-5199,5201-5203 and 5218-5221.

Continuation of Disposition of Claims: Claims objected to are 2194,2197-2199,2201,2216,2220-2225,2227,5176,5178,5179,5191,5195,5196,5204,5222,5223 and 5227.

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1. The indicated allowability of claims 2193, 2195, 2196, 2202-2215, 2217, 2218, 2226, 2228-2231, 5175, 5177, 5180-5190, 5192, 5194, 5197-5199, 5201-5203, 5218-5221 is withdrawn in view of the newly discovered reference(s) to Hendrick (3,954,140). Rejections based on the newly cited reference(s) follow:

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 2193, 2195, 2196, 2202-2215, 2217, 2218, 2226, 2228-2231, 5175, 5177, 5180-5190, 5192, 5194, 5197-5199, 5201-5203, 5218-5221 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hendrick (3,954,140) and the reference to Porter.

Hendrick discloses a process for treating an oil shale or coal formation by providing heat from a plurality of electrical heaters or heating elements (29) to evolve hydrocarbon products from the coal, while controlling the pressure within the central shaft (11) or coal formation (10). Hendrick (col. 7, lines 28-45) particularly calls for operating the heating process in such a

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manner as to "maintain the selected pressure within a given formation", apparently for allowing hydrocarbon gases or products which are driven into the central shaft to be produced through conduit (18). It is further deemed that the central shaft (11) penetrating the coal formation can be construed as "production well", as evidenced by the reference to Porter (page 319) which discloses that a well may comprise "a shaft ... sunk into the ground to obtain oil, gas, water". While Hendrick does not disclose or indicate any exemplary such "selected pressure", to operate the Hendrick coal heating process such that formation pressure is controlled or maintained "at least about 2.0 bars absolute", as called for in independent claims 2193 and 5175, would have been an obvious matter of choice or design to one of ordinary skill in the art based on, e.g. the characteristics or composition of the particular coal formation encountered in the field, in order to ensure or enable hydrocarbon gases driven or evolved directly into the central shaft are produced out through conduit (18). Further with respect to independent claims 2193 and 5175, it is deemed that the process of Hendrick will inherently or necessarily increase the permeability of the coal, and to the extent recited. Alternatively, to increase the permeability to greater than 100 millidarcy or "greater than about 5 Darcy", as called for in claim 2226, would have been an obvious matter of choice in order to ensure adequate fluid flow through the formation, i.e., that the hydrocarbons evolved or yielded from the oil shale formation move through the formation and downhole conduit(s) as a vapor, e.g. "hot gases", "cooler gases", prior to processing in the the downhole fractionator (19). Further with regard to independent claim 5175, it is deemed that the "hot hydrocarbon gases" evolved from the coal formation would necessarily or obviously comprise or include a non-condensable hydrocarbon component. Moreover, the precise

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composition of the product fluids is seen as dictated by the type of coal naturally occurring in the particular coal formation actually encountered in the field.

As per claims 2195, 5201-5203, 5177 and 5219-5221, it is noted that the heating of the coal formation from the electrical heaters (29), carried out in the temperature range disclosed in Hendrick (col. 6, lines 60-68) of "575-725oF", is sufficient to "convert" or effect "thermal extraction" of the coal. Thus, Hendrick is deemed to necessarily or obviously comprise effecting "pyrolysis" of the coal, as recited, by maintaining the formation temperature within a pyrolysis temperature range.

As per claims 2202, the precise heating rate recited is deemed an obvious matter of choice or design, especially in carrying out the embodiment in Hendrick in controlling and/or maintaining the temperature, e.g., by providing the electrical heaters (29) with "suitable temperature sensors and controls" (col. 6, lines 28-48) within the specific operating range of "575-725oF", as noted above.

As per claims 2203 and 5180, it is deemed that the coal formation is inherently or obviously heated "substantially by conduction" in view of the illustration of Figure 3 which depicts the electrical heater in direct contact with the casing (23).

As per claims 2204 and 5181, it is deemed that the thermal conductivity recited may necessarily or obviously occur or result in the process of Hendrick, depending on the characteristics and composition of the particular coal formation encountered. Moreover, it appears that thermal conduction is clearly occurring in the coal formation heated and processed by Hendrick.

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Regarding claims 2205-2215, 2217, 2218, 5182-5190, 5192 and 5194, it is deemed that the myriad hydrocarbon product mixtures recited in these claims would necessarily or obviously occur in carrying out the combined heating and downhole refining process of Hendrick. Moreover, the precise composition of the product fluids is seen as dictated by the type of coal naturally occurring in the particular coal formation actually encountered in the field. Moreover, it would be an obvious matter of choice to operate the Hendrick process to minimize what would be considered refinery contaminants, such as sulfur, nitrogen and/or oxygen in the product mixtures. Similarly, it would be obvious to reduce or minimize the amount of asphaltenes in the product mixtures for optimum downstream refining. Also, in the event that the particular coal or oil shale deposit encountered yields ammonia gas, it would be an obvious expedient to utilize it in a commercial process such as fertilizer production.

As per claims 2228 and 5197, Hendrick (col. 6, lines 41-68) similarly controls the heat applied by the electrical heaters via "suitable temperature sensors and controls" and within a range of 575-725oF. Accordingly, it is deemed that Hendrick will similarly yield greater than "60% by weight" of the Fischer Assay of hydrocarbons, especially in view of the multi-step heating embodiment of Hendrick, i.e., heating the coal formation to both a first and "second determined temperature" (note col. 4, line 66 - col. 5, line 14).

As per claims 2229, 5198, 5199, 5218 it is deemed that the central shaft (11) penetrating the oil shale formation can be construed as production well. In which case, clearly there are "at least about 7 heaters" or "at least about 20 heaters", as illustrated in the drawing figures of Hendrick.

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As per claims 2230 and 2231, the process embodiment(s) recited wherein the heaters are disposed in the formation in a triangular pattern or repetitive triangular pattern is deemed disclosed and depicted in the embodiment of Figure 2 of Hendrick (note also col. 6, lines 22-28). In this regard, the heater/horizontal borehole offset between the adjacent rows would appear to define or could be construed as comprising a triangle pattern, as viewed from the wellbore or central shaft (11).

5. Claims 2194, 2197-2199, 2201, 2216, 2220-2225, 2227, 5176, 5178, 5179, 5191, 5195, 5196, 5204, 5222, 5223 and 5227 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

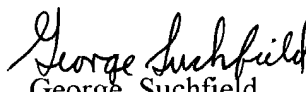
6. Claims 2232-2238, 2241-2269, 5081-5087, 5089, 5090, 5150-5153, 5155-5174, 5200, 5205-5217 and 5224-5226 are allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to George Suchfield whose telephone number is 703-308-2152. The examiner can normally be reached on M-F (6:30 - 3:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bagnell can be reached on 703-308-2151. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


George Suchfield
Primary Examiner
Art Unit 3672

Gs
May 7, 2004